AUSTRALIAN MATHEMATICS COMPETITION
WARM-UP PAPER
INTERMEDIATE 8

Questions 1 - 4, 3 marks each

1. $(0.01)^2$ equals

   (A) 0.1   (B) 0.01   (C) 0.001   (D) 0.0001   (E) 0.0002

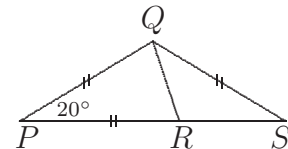2. The value of $\dfrac{0.75}{15}$ is

   (A) 5   (B) 0.5   (C) 0.05   (D) 0.005   (E) 0.0005

3. In the diagram $PQ = PR = QS$ and $\angle QPR = 20°$. The size of $\angle RQS$, in degrees, is

   (A) 20   (B) 40   (C) 60

   (D) 80   (E) 100

4. My children are aged six, eight and ten years. Between them they receive $12 pocket money each week, proportional to their ages. How much does the eldest receive per week?

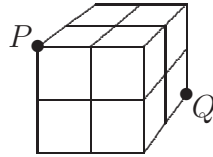   (A) $3   (B) $4   (C) $5   (D) $6   (E) $10

Questions 5 - 8, 4 marks each

5. Two fractions are equally spaced between $\frac{1}{4}$ and $\frac{2}{3}$. The smaller of the two fractions is

   (A) $\dfrac{13}{24}$ (B) $\dfrac{7}{18}$ (C) $\dfrac{29}{36}$ (D) $\dfrac{5}{12}$ (E) $\dfrac{1}{3}$

6. Triangle PQR is right angled at Q and triangles PST and RTU are isosceles as shown. If $\angle STU$ measures $x°$ then the value of x is

(A) 30   (B) 45   (C) 50   (D) 55   (E) 60

7. The diagram shows a 5 by 5 table.

The top row contains the symbols P, Q, R, S and T. The fourth row contains the symbols P, Q and R at the centre. The remaining squares can be filled with Ps, Qs, Rs, Ss and Ts such that no row, column or diagonal contains the same symbol more than once. The symbol that must go into the shaded square is

(A) P (B) Q (C) R (D) S (E) T

8. If $a^2 = a + 2$, then a^3 equals

(A) $a + 4$ (B) $2a + 8$ (C) $3a + 2$ (D) $4a + 8$ (E) $27a + 8$

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Questions 9 - 10, 5 marks each

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9. Here is the plan of a building which has a courtyard with two entrance gates. Passers-by can look through the gates but may not enter. Dimensions of the building are given in metres, and all corners are right angles. What is the area, in square metres, of that part of the courtyard which cannot be seen by passers-by?

(A) 250   (B) 200   (C) 300   (D) 400   (E) 325

10. Each face of a solid cube is divided into four as indicated in the diagram.

Starting from vertex P, paths can be travelled to vertex Q along connected line segments. If each movement along the path takes one closer to Q, the number of possible paths from P to Q is

(A) 46   (B) 90   (C) 36   (D) 54   (E) 60